Jin MURATA*: **Taxonomic notes on verrucose species of *Arisaema* (Araceae)**

邑田 仁*: *Arisaema asperatum* および近縁種の分類

Plants of *Arisaema* usually have smooth surfaces, but there are exceptions. Apart from *Arisaema hirsutum* Hu, which was transferred to the genus *Typhonium* (Murata & Mayo, in press), plants with verrucose or asperate petioles and peduncles are restricted to sect. Trisecta. *Arisaema verrucosum* Schott (1857) was described from Kumaon, India, and characterized by its markedly verrucose petiole. *Arisaema asperatum* was described from Hubei, China, by N.E. Brown (1903), who noted that it was closest to *A. verrucosum* but distinct in its inflorescence and in the petiole being much more densely covered with short cylindric or conical processes. *Arisaema salwinense* Handel-Mazetti (1925) was described from Yunnan, China and distinguished from *A. utile* Hook. f. var. *meeboldii* Engler by differences in the shape of the inflorescence and length of the petiole. The peduncle of this species was described as 'muricato-verrucosus'. The inflorescence of *A. salwinense* is similar to that of *A. bonatianum* Engler (1920), which was described from China on the basis of an inperfect specimen consisting of two inflorescences only. *A. pradhanii* C.E.C. Fischer is very similar to *A. griffithii*, but they were distinguished mainly by differences in coloration (Fischer 1936). Recently, Hara (1971) reduced *A. verrucosum* to a variety of *A. griffithii* and suggested that verrucose petioles might be found in *A. elephas* Buchet of W. China. *Arisaema pradhanii* was recognized as a synonym of *A. griffithii* var. *verrucosum* by Hara (1971). Handel-Mazzetti's (1936) placement of *A. salwinense* as a synonym of *A. griffithii* var. *verrucosum* was followed by Li (1979), who recognized *A. asperatum* and *A. bonatianum* as different species and described *A. elephas* as having either smooth or verrucose petioles.

This study, based on observations of herbarium specimens in B, BM, E, K and W, including types, reconsiders the taxonomy of the verrucose species.

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Nature of verrucosity Judging from descriptions and illustrations, there are two types of projections on the surface of some species of *Arisaema*. One type (here called the verrucose type) occurs in *A. verrucosum* (Plate 6b in Hara 1971) and *A. pradhanii* (Fischer 1936), has projections appearing as small, dark warts. The petiole of *A. utile* Hook. f. is usually dark spotted (Plate 18c in Hara 1971) and the spotted portion might be raised as a wart. Consequently, the warty surface may occur both in *A. griffithii* and *A. utile*. The plants referred by Hara (1971) as 'some specimens from Simla and the drawing of *A. verrucosum* by Schott have ovate spathe-blade similar to those of *A. utile*' may be *A. utile* with warty surfaces. Another type (here called the asperate type) occurs in *A. wilsonii* Engler (Wu 1986), has semi-translucent conical spines much smaller than the projections in the verrucose type. Accordingly, the two types of projections can be distinguished by shape in herbarium specimens. Authentic materials of *A. asperatum* and *A. salwinense* have been found to have asperate projections.

Distinction of species It is uncertain whether verrucosity on the petioles and peduncles is stable within a species or not. Therefore, it is necessary to discriminate species by other characteristics. Inflorescences of the verrucose species can be segregated into three categories as in Tab. 1.

Category 1: *Arisaema asperatum* is the only species in sect. Trisecta with a short spadix appendage not exserted from the spathe (Fig. 1A, 1B). Although the shape of the spadix appendage is similar to those in sect. Franchetiana,

Tab. 1. Categories of inflorescence morphology in verrucose species of *Arisaema*, distinguished by the shape of spathe and spadix appendage.

Spadix appendage / Spathe	cylindrical, not exerted from spathe	flagellate in the upper part, long exerted from spathe
blade ovate to obovate	Category 1 *A. asperatum*	Category 2 *A. griffithii* *A. verrucosum* *A. pradhanii*
blade distinctly spreading laterally, auriculate		Category 3 *A. elephas* *A. wilsonii* *A. utile* *A. salwinense*

the spindle-shaped ovaries and spathe with lamella inside suggest that this species belongs to sect. Trisecta.

Category 2: The inflorescences of both *A. verrucosum* and *A. pradhanii* are very similar to those of *A. griffithii* and are considered to be within the ranges of variation of *A. griffithii*. Apart from the nature of the surface of the petioles and peduncles, no distinction has been found between them, which supports Hara's (1971) treatment.

Category 3: This category may be subdivided into two: In *A. wilsonii* and *A. elephas* (Fig. 1C), the spadix appendages, except the stipe, are generally thick in the basal part and gradually narrowed to the apex, while in *A. utile*, *A. bonatianum* (Fig. 1E) and *A. salwinense* (Fig. 1D), they are rather abruptly constricted and become slender near the base. Both *A. wilsonii* and *A. elephas* show a wide range of variation and further studies are necessary to discriminate these species. Although *A. utile* also shows a wide range of variation, this species is distinguished from *A. salwinense* on the basis of the nature of the projections, as discussed above. Observation of the type specimen of *A. bonatianum* revealed that it agrees well with *A. salwinense*. Consequently, *A. salwinense* is regarded as a synonym of *A. bonatianum*.

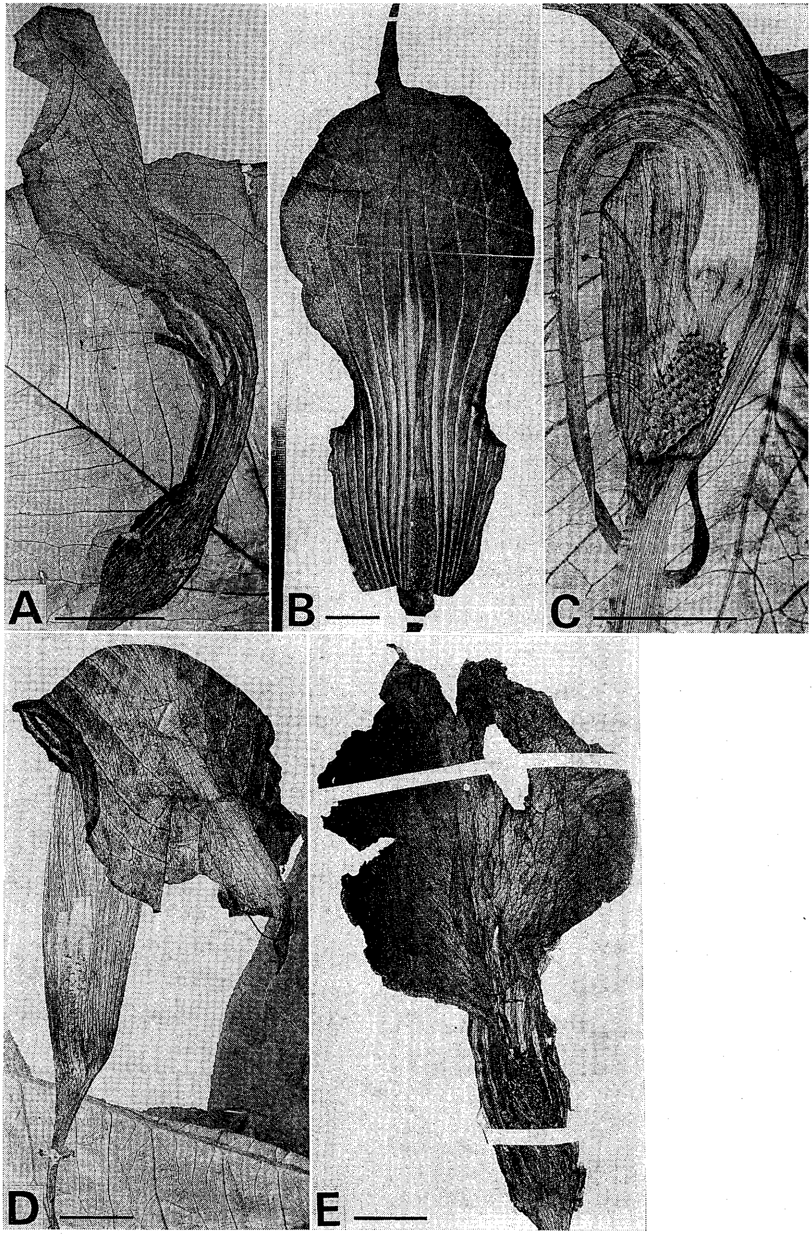
Distribution Plants with verrucose projections are distributed mainly in the Himalayan region and extend into adjacent Tibet, while those with asperate projections are distributed mainly in central and south central China and extend to the adjacent eastern Himalayan region (northern Burma and Assam). *Arisaema asperatum* appears to be distributed disjunctly in central China and the eastern Himalaya (Fig. 2).

Arisaema bonatianum Engler, Pfl.-reich **73**(4-23F): 214 (1920)——Li, Fl. Reip. Pop. Sin. **13**(2): 146 (1979).

Arisaema salwinense Hand.-Mazt., Anz. Akad. Wiss. Wien. Math.-Nat. **61**: 123 (1924).

A. griffithii var. *verrucosum* sensu Hand.-Mazt., Symb. Sin. **7**: 1368 (1936)——Li, Fl. Reip. Pop. Sin. **13**(2): 149 (1979).

Distribution (Fig. 2). China. Yunnan: Tjiomtson—Lumba, 2050-3150 m, Jul. 2, 1916, Handel-Mazzetti 9203 (holotype of *A. salwinense*, W); N. Maika—Salwin divide, 26°10′N, Jun. 1919, Forrest 18089 (E, K); Slawesi—Salwin divide, 25°50′N, 98°48′E, 9000-10000 ft, Aug. 1924, Forrest 24789 (E); Shweri—Salwin


A
B
C
D
E

divide 25°6′N, 8000 ft, Jul. 1931, Forrest 29808 (E); Felsiges Gelände am Mekong, um 3000 m, Maire 7212 (holotype of *A. bonatianum*, B). Burma. western flank of the Chiwi-li, N'Maika—Salwin divide, 12000 ft, 26°24′N, 98°48′E, Jun. 1925, Forrest 26950 (E, K). India. Assam: Delei Valley, 28°21′N, 96°37′E, 9000-10000 ft, Jun. 6, 1928, K.-Ward 8298a, 8298b (K). Delei Valley, 28°21′N, 96°37′E, 11000 ft, Jun. 10, 1928, K.-Ward 8318 (K).

Arisaema asperatum N.E. Brown, J. Linn. Soc. Bot. **36**: 176 (1903)——Li. Fl. Reip. Pop. Sin. **13**(2): 144 (1979).

Distribution (Fig. 2). China. Hubei: Ichang, Patung District, Oct. 1887, Henry 3776 (holotype K). North China: Liou, Kia Tien Ze, S.E. Kanson, May 26, 1919, Licent 5327 (BM, K). Shensi: Taipeishan, 1910, Purdon 4570 (K). Burma. North Triangle, Chring Bum, above Ahkail, 9000 ft, 14 May 1953, K.-Ward 20841 (BM). India. Assam: Deley valley 28°21′N, 96°37′E, 9000-10000 ft, Jun. 6, 1929, K.-Ward 8299 (K, mixed with *A. lobatum*).

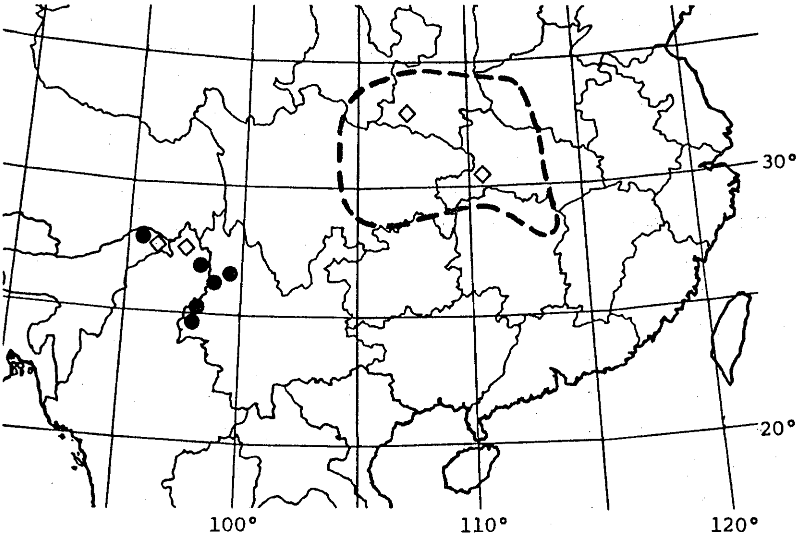


Fig. 2. Distribution of *Arisaema bonatianum* (solid circles) and *A. asperatum* (open squares). Broken line shows approximate distribution range of *A. asperatum* in China based on Li (1971).

Fig. 1. Inflorescences of *Arisaema*. A: *A. asperatum* (Henry 3776, holotype K). B: *A. asperatum* (K.-Ward 20841 BM). C: *A. elephas* (Ludrow, Sherriff & Taylor 4707a BM). D: *A. salwinense* (Forrest 18089 E). E: *A. bonatianum* (Maire 7212, holotype B). Bars indicate 5 cm.

I wish to thank the directors and curators of the herbaria who let me study the specimens in their care.

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テンナンショウ属植物は一般に平滑であるが、ヒマラヤテンナンショウ節 sect. Trisecta の一部には花茎や葉柄に細突起を持つものがある。本研究では従来の研究および腊葉標本を比較検討することにより，これらについて以下の結果を得た。1）*A. asperatum* (Fig. 1A, B) は刺状で半透明の突起を持つ。花序付属体の先が長く伸びない点でヒマラヤテンナンショウ節で独特であり，Franchetiana 節に似ている。しかし，子房が円錐状であり仏炎苞の筒部内側に縦方向に張り出す多数の翼があることはヒマラヤテンナンショウ節に属することを強く示唆している。2）広く耳状に張り出す仏炎苞を持つ *A. griffithii*, *A. verrucosum*, *A. pradhanii* は互いによく似ており，細突起の有無以外では区別できない。このことは *A. verrucosum* (=*A. pradhanii*) を *A. griffithii* の変種とみる Hara (1971) の見解を支持する。*A. griffithii* var. *verrucosum* は黒紫色で瘤状の突起を持つ。*A. utile* の中にもこのような突起を生ずるものがある。3）*A. salwinense* (Fig. 1D) は刺状で半透明の突起を持つが，花序の特徴からは，先に発表された *A. bonatianum* (Fig. 1E) から区別できず，その異名と見なされる。*A. bonatianum* は花序付属体が柄の上でいったん広がるが，すぐに細くなって糸状に伸びる点で次の種類と区別できる。4）*A. elephas* (Fig. 1C) にも刺状で半透明の突起を持つものがある。しかし，花序付属体は柄の上で広がり，上方に向かって次第に細ま

る。*A. wilsonii* はこれによく似ており，今後の分類学的検討が必要である。5）分布的に見ると，黒紫色で瘤状の突起を持つ種類は主にブータン以西の東ヒマラヤ地域に分布するのに対し，半透明で刺状の突起を持つ種類は主に中国中・西部に分布する。*A. asperatum* は従来中国に固有とされてきたが，アッサムとビルマ北部にもある(Fig. 2)。

□林　一六：**植生地理学**（自然地理学講座５）269 pp. 1990. 大明堂，東京．￥3,090. 大学における植生地理学の教科書として書かれた。植物とその環境，植生調査法，世界の植物区系と群系，世界の植物群落の分布，植生遷移，日本の植生，植生史の７章からなる。本書の約半分を占める「世界の植物群落の分布」の章は，まず世界を主に地理的に区分したのち，各地域にみられる群落・植生ごとに，その位置や気候条件，植生や植物についての説明が与えられている。豊富な写真や付図と併せて，簡便な世界の植生事典にもなっている。巻末に40頁を越える文献表がある。教科書として，十分その目的達成に成功している。（三浦宏一郎）

□北村四郎：**花の研究史**（北村四郎選集Ⅳ）671 pp.，彩色口絵２，単色図版39. 1990. 保育社，大阪．￥9,500. 副題は「アジア東部の顕花植物を研究した本草学者と植物学者の伝記。」本書の内容は他に出版されたものに，書きおろしの文章を加えたもので，執筆者がこれらを調和させるために種々工夫されていることが分る。しかし方々に突出した部分があり，これがまた大変ユニークで面白いのである。初めの数章の総論というか導入部の後に，学者の年代順に主として明治期から昭和末年までの伝記が配列されている。日本を中心とし，東部アジアの関連した地域の日本人の，その他の西欧人の伝記によって植物分類学の発展が分る。著者の最も重んじる正確な事実を書いておくという心組みが感じられる。また直接に交際のあった人々に関して人間味がぢかに伝えられる。江戸時代は岩崎灌園，飯沼慾斎の大著の解説があり，明治以後ははじめは東京大学，その後は京都大学，九州大学，北海道大学関係に及び，採集家のことも少しはある。この期の外国人の伝記ではフランスの人々の活躍，Wilson, Merrill, Handel-Mazzetti などが紹介される。フランス関係は著者の得意とする所で，きわめて目新しい。「小泉先生伝」は師を中心とする京都大学研究集団の詳しい記事で，著者以外にはこのような形ではまとめられなかったものであろう。また昭和天皇に関しては数十頁を費していて，御逝去前後のあわただしいマスコミとのいきさつも書かれている。口絵にある Kiniphoph の印葉図（1761）は非常に珍らしいものの由，著者の好書家ぶりの一端がうかがえる。（津山　尚）